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Ventral Hernia after Laparotomy, and its Surgical Treatment.

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REPRINT FROM VOLUME XII
Gynecological Transactions.
1887.







BEFORE OPERATION.



FOUR MONTHS AFTER OPERATION.

VENTRAL HERNIA AFTER LAPAROTOMY, AND ITS SURGICAL TREATMENT.

BY JAMES R. CHADWICK, M. D.,

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THE history of all the cases of hernia after laparotomy, of which I have found record, shows that the hernia does not result immediately after operation, but first appears a year or more later; that the protrusion increases steadily from year to year until it may assume enormous proportions; that, while palliative treatment by abdominal belts and the like in some instances seem to have arrested the progress of the lesion for the brief period during which the patients have been under observation, in most cases they have been of little avail, and have been a constant care and annoyance to the patient.

These considerations, taken in connection with the unintermitting, though not severe, sufferings of the patient that render life a burden, impel us to seek means for a radical cure. These symptoms are a constant dragging sensation at the seat of the lesion, meteorism, colicky pains throughout the abdomen, indigestion, and constipation. Liability to inflammation of the sac, and a knowledge that the protrusion is sure to increase in size, contribute largely to rob the patient of all comfort in existence. Strangulation, though a perpetual menace in the ordinary ruptures (including the umbilical), and even in those occurring at other than the usual points in the abdominal walls as a result of stabs, bruises, abscesses, etc., has not supervened in any of the herniae after laparotomy. This exemption from strangulation is undoubtedly

due to the fact that the neck of an inguinal, femoral, or umbilical hernia is invariably small in comparison with the size of the sac and unyielding. The reverse is usually true of hernia following operations.

The *diagnosis* calls for little comment before this Society beyond allusion to the fact that, while the tumor ordinarily yields a tympanitic note on percussion, it will not do so if it contains chiefly fat, omentum, or ascitic fluid. Furthermore, it must be borne in mind that, though the contents of the tumor can generally be forced back into the abdominal cavity, this may not be possible if the intestines or omentum are adherent to the lining membrane of the sac in consequence of past inflammatory action. A pseudo-membranous band, of inflammatory origin, in the sac of an umbilical hernia has, however, been known to cause strangulation by causing torsion.

The precise location of the recti muscles, which is often masked by their tenuity and by the subcutaneous fat, may be made evident by having the patient, when recumbent upon her back, raise her head and shoulders from the bed; the two recti will then stand out as rigid bands on either side, while the temporarily increased intra-abdominal tension will cause the hernia to assume its utmost volume.

The *frequency* of hernia after laparotomy must be greater than is appreciated; the data for its determination are, however, wanting.¹ When laparotomy was restricted to cases in which abdominal tumors were so large as to have greatly distended the abdominal parietes, the edges of the wound were less liable to be dragged asunder by the flatulent distention so general after operation. The present practice of early operation for the removal of small tumors, unenlarged ovaries or tubes, etc., is likely to increase the liability to hernia; this is, however, offset by the shortness of the incision now

¹ "I have been rather surprised to find that thirty women out of over three hundred, or nearly ten per cent, have ventral hernia."—Dr. John Homans in *Three Hundred and Eighty-four Laparotomies for Various Diseases*, Boston, 1887, p. 4.

needed, the more frequent healing of the wound by first intention under the aseptic system, and by the intra-abdominal treatment of the pedicle. Whether the use of a glass drainage-tube, passed through the abdominal incision, predisposes to hernia is a mooted question, to be determined by future experience. To obviate this possible objection to the tube, I would advise the insertion of a suture through both sides of the wound at the site of the tube, by means of which the margins may be brought into apposition after withdrawal of the tube.

THE CAUSES AND PREVENTION.—The instances of hernia after laparotomy, thus far published, are too few, and even these too meagrely reported, to show what method of closing the original wound will prevent their occurrence. Some authors lay great stress on suture of the peritoneum independently by catgut before closure of the musculo-aponeurotic wall by silk, silver wire, or catgut. As neither they nor other operators have published the percentage of their cases which have been followed by hernia, we have no data by which to estimate the value of their opinions. While perfect union of the peritoneum may tend to favor the union of the musculo-aponeurotic layers external to it, we have no reason to believe that the condition of the peritoneum has any effect upon the development of hernia. The fact that hernia occurs as readily with an intact peritoneum as with one that has been severed, shows that it has practically no retentive power. For this reason I am not one to lay great stress on this procedure, especially as it lengthens the operation—an objection of serious import. Dr. Gill Wylie¹ very wisely lays stress upon the fact that it is the tendinous fascia of the transverse and oblique abdominal muscles which divides to "form the sheath of the recti muscles, and unites in the median line to form the linea alba," which in reality gives its retentive power to the abdominal walls. He says that "the recti are longitudinal and are readily pushed aside by a wedging or

¹ "Ventral Hernia caused by Laparotomy," *Am. Journ. of Obstetrics*, vol. xx, No. 1, January, 1887, p. 27.

separating transverse force; as a rule, this thick fascia is cut over one of the recti and not in the linea alba. If it is cut longitudinally over, say the right rectus, the fascia retracts to that side and the muscles roll out. When the wound is closed, unless the retracted fascia is caught by forceps and pulled over the protruding muscle, and thus brought into apposition with the other side, the muscles or adipose tissue will separate the edges of the fascia and leave a weak spot in the wound. After a time, when the induration caused by exuded lymph has softened, or the new connective tissue atrophied and been absorbed, a hernia will begin." "To secure good apposition," he adds, "I always have my assistant ready with forceps to pull up the retracted edges as I am putting in the sutures; and, when the intra-abdominal tension is excessive, I often sew the edges of the fascia together with separate sutures, or a continuous suture, after I have inserted the deeper ones; of course, tying the latter as I proceed, so as to avoid the chance of catching a loop of intestine with my deep suture." Dr. Gill Wylie's great experience and sagacity have fitted him to recognize union of the musculo-aponeurotic layers as the first essential in effecting a cicatrization of the abdominal incision which shall be permanent. I have no doubt that, when the incision has been through the rectus muscle, we have often deemed ourselves secure when we have passed our sutures through the divided muscle without noting whether we have likewise included the tendinous fascia constituting its sheath. In most cases, we probably include the fascia whenever the sutures are inserted an inch back from the edge, as was done in the operation for hernia which I shall soon report.

Other important factors in the prevention of hernia are the insertion of the sutures sufficiently near to each other to prevent gaping of the wound, and a reduction of the intra-abdominal tension to a minimum during the week following the operation. Judgment, guided by experience and a correct appreciation of the individual differences of cases as to the thickness of the wall, the amount of subcutaneous fat,

the length of the incision, etc., must determine the proper distance between the sutures. Tension of the abdominal walls subsequent to operation may be lessened by withholding food and drink and especially opium, all of which contribute to the development of gas in the intestines and to occasion vomiting. An early resort to enemata and laxatives should doubtless be practised more often than it is.

OPERATION.—Under the old dread of opening the peritoneal cavity, Gustav Simon devised and performed more than once an operation in which he has since been followed by but few operators. The hernial sac was pushed back through the cleft between the recti muscles, so that in place of the former projection there remained a cavity with a wide mouth. The borders of this mouth were then denuded through the fat down to the subcutaneous connective tissue. The two broad, elliptical, denuded surfaces were then secured in apposition, the one to the other, by three longitudinal rows of catgut sutures. Union was thus secured and amelioration obtained by the patients. As the operation clearly does not close the rent in the torn retaining wall of the abdomen (the musculo-tendinous), but merely seeks to plug it with a mass of folded integument, it is not to be recommended except possibly in very large hernia when the intestines may be supposed to be universally adherent to the sac.

Before describing the radical operation which is based upon the correct principle of seeking to obtain union of the aperture in the musculo-tendinous wall of the abdomen, I want to dissipate the prejudice against such an operation that may arise from the poor success that has attended all the operations that have been devised for the radical cure of the classical herniæ. The distinction which I wish to make is this: Inguinal and femoral herniæ take place at points where the abdominal wall is anatomically weak; the margins of the apertures are formed of tendons which have practically no distensibility, so that the neck of the hernia remains comparatively small, thus predisposing to strangulation. What

is more important from a surgical standpoint: the margins are so held anatomically that they cannot be approximated by any surgical device so as to secure their cohesion and thus close the opening through which the protrusion has taken place. These considerations do not pertain to ruptures in the linea alba. The size of the opening follows no law based upon anatomical conditions, but varies greatly according to the extent of the original lesion and the deficiency in the reparative process. The neck of a ventral hernia consequently averages much larger than that of the other herniæ, and tends to increase.

Ventral hernia is suitable for operation because the walls of the cleft in the musculo-tendinous fascia can be readily approximated and secured in apposition until they unite. The true retaining wall of the abdomen is thus restored in its original integrity. Intra-abdominal tension is the only obstacle to success, and this is encountered in operations upon all varieties of herniæ. The presence of cicatricial tissue from the previous laparotomy might be supposed to interfere with healthy union, but has not seemed to have acted prejudicially in the few cases thus far reported.

After this long prelude it might be inferred that I should have much to say about the operation for the radical cure of ventral hernia. The principles which I have already discussed under the head of *Prevention* apply so fully to the operation itself that but little need be added. I have sought to show that the hernia resulted from a failure to secure firm union of the musculo-aponeurotic layer of the abdomen, from which it may be inferred that the operation to repair the imperfection of the primary operation is in reality but a simple abdominal section, or, to adopt a familiar term, an "exploratory incision," in which special care is demanded to reestablish the true retaining wall of the abdomen in its original integrity.

There are, however, two points of variance which demand consideration:

1. In simple abdominal incision, we know that we shall

find the peritoneum intact. In cutting open the sac of a ventral hernia, we do not know whether the peritoneum will be found whole, in which case it may form an inner sac-wall independent of the cellulo-cutaneous wall of the hernia, as in inguinal hernia, or the peritoneum may have become so adherent to, and incorporated with, the latter as to be indistinguishable from it.

2. Finally, the peritoneum may have failed to unite so that no peritoneal layer intervenes between the intestines and the cellular tissue, as in umbilical hernia.

1. If the peritoneum is intact and non-adherent, the question may arise whether it should be simply pushed through the aperture into the abdominal cavity without being opened and the fascia sutured outside of it, or whether it should be incised. The former course insures perfect immunity from the entrance of germs into the peritoneal cavity, but renders the insertion of the needles more difficult owing to the danger of wounding the intestines by the needles passing accidentally into the cavity of the abdomen during insertion. If the peritoneum is adherent to the cutaneous wall of the hernia, the neck cannot well be reached without making an opening through.

2. If the peritoneum is found not to have united, incision into the sac will, of course, open directly into the peritoneal cavity.

In Dr. Richardson's case the peritoneum was intact, and was readily dissected off the other layers of the hernial wall. He found it impracticable to insert the sutures and close the cleft without incising the peritoneal sac. In my case the peritoneum had apparently failed to unite, but it was impossible to distinguish how much of the sac-wall was lined with peritoneum. My first incision was carried designedly through the whole wall. As the cleft in the tendinous fascia was six inches long, and the wall at each side covered with at least three inches of cellular tissue, no other course was feasible.

The second point of variance between the operation for

hernia and an ordinary abdominal incision arises from the relations of the peritoneum to the cleft in the musculo-tendinous wall. In abdominal incision the cut edges of the musculo-tendinous fascia can be brought directly into apposition. In the operation for hernia, on the other hand, they will be found to have retracted, and in any case to have been covered with the extruding peritoneum. In suturing the wound, can we simply bring into apposition the edges of the rent, covered as they are with peritoneum, and feel assured that they will adhere permanently, or is it incumbent upon us to dissect off the peritoneum so that the raw edges of the fascia may come directly in contact? Dr. Gill Wylie¹ describes his method as follows: "After opening the sac, separating the adherent omentum or intestines, and returning them to the peritoneal cavity, I carefully dissect out the peritoneum and the deep abdominal fasciæ. Then I cut away the superfluous peritoneum and skin; next I place a number of deep sutures of silver wire or strong silk; then I bring into apposition the edges of the deep fasciæ with one set of sutures of catgut or small silk, and as I tie the deep sutures, if indicated, I may put in a second set of interrupted sutures in the fasciæ so as to turn in the first set, and bring together a broader surface than the mere edges of the fascia. In other words, if the edges are thin, I may sew the fasciæ with Lembert's sutures. In this way I have got good union after having failed in a former operation done by the ordinary sutures. The edges of the fasciæ may be retracted an inch or more from the median line, and it is very tedious work to dissect them out and get them into good apposition." Hoffa² thinks we can insure a firm closure of the abdominal incision after laparotomy by suturing the peritoneum, the recti, and the skin separately, provided we do not allow the patient to leave the bed too soon, and insist upon her wearing a suitable belt. He cites the case of Maas (reported below) in evidence

¹ *Loc. cit.*, p. 31.

² "Zur operativen Behandlung grosser Ventralhernien." *Münchener med. Wochenschr.*, xxxiv Jahrg., No. 8, pp. 133-135, Feb. 22, 1887.

that the same method will not guarantee success after the radical operation for a ventral hernia of long standing. He endorses the advice of Maydl¹ to make an extensive denudation of the recti muscles, and seek to secure a broad union of them.

In my case, when planning the operation, I had it in mind to denude the edges of the fissure in the musculo-tendinous wall before suturing them, but I renounced this purpose when I found how thick a layer of fat overlay the fasciæ; how extensive a dissection would be required to uncover them round an opening that measured at least sixteen inches in circumference; how greatly the danger of shock and septic infection would be enhanced by allowing the intestines to remain outside the abdominal cavity (even though covered with hot aseptic towels) during the hour or more required for the procedure. I consequently brought the peritoneal surfaces covering the thick recti muscles into apposition by a single row of silk sutures introduced at least an inch back from the free edges of the muscles. Of course, as only five months have elapsed since the operation, I cannot vouch for the permanency of the cure.

As I have only been able to find full reports of six cases, each done by a different method, and all but one successful, I cannot express any decided preference for one method over another. Perhaps Dr. Gill Wylie, who alludes to six operations occurring in his practice during the past year, or some one else, may give us data on which to base our conduct. Until we have such, it behoves us to remember the wise saying of Renan: "Qui sait si la sagesse d'esprit ne consiste pas à s'abstenir de conclure."

CASE OF THE AUTHOR.

CASE I.—On April 12, 1887, Mrs. X. entered my private hospital for operation, with the following history: She was forty-four years of age, of large frame, considerable muscular

¹ "Ueber eine neue Methode der Radicaloperation bei Herniæ ventrales." *Wiener med. Presse*, Bd. xxvii, No. 40, pp. 1298, 1299, October 3, 1886.

development, and quite fat. She was married in 1870, had had one child and one miscarriage—the latter in December, 1872. On January 24, 1872, she submitted to an operation by one of our oldest ovariotomists, whereby an ovarian tumor weighing sixty pounds was removed. The incision in the linea alba extended from the navel nearly to the pubes. The abdominal incision was closed with unusual haste owing to failure of the pulse and threatening collapse. The pedicle was secured in the lower angle of the wound by an external clamp, according to the general practice of that day. The convalescence was fairly normal, except that there was considerable suppuration in the abdominal walls about the sutures and the stump of the pedicle. She left her bed at the end of a month, wearing an abdominal belt. Three years later the lower angle of the cicatrix began to bulge in spite of the belt; the London supporter, which is an elastic belt with an oval metal plate covering the line of the abdominal cicatrix, was then tried, and subsequently every form of truss of which she could learn. In spite of these the hernia increased in size little by little; the patient could feel the tissues pull apart whenever she made a violent effort or slipped. The menstrual periods lasted ten days, about one third of the total amount of blood lost always flowing from the stump of the pedicle. In 1880, after slipping, she had an attack of inflammation in the sac of the hernia, confining her to bed for two weeks. In 1884 a similar slight attack kept her in bed two days. For the past two years the lower portion of the hernia has been protruding beyond the general level, and its covering growing more and more thin. During all these years she has suffered constant lancinating pains in the hernia, and has had much indigestion; otherwise, her health has been perfect. Her decision to submit to an operation for a radical cure of the hernia was attributed to these pains, and a fear of accidental rupture of the prominent portion of the sac.

I found the abdominal walls loaded with fat to the depth of three or four inches, which greatly masked the extent of the hernia; a distinct protrusion was, however, manifest in the median line just below the umbilicus, connected by a less defined ridge running downward, and ending in the projection that overhung the mons veneris, as shown in the photograph.

The covering at this prominent part was so thin, and became so tense on the least exertion, as to warrant the patient's fear of rupture. At the base of this elevation, on the right side, was the cicatrix of the pedicle, from which a cord could be felt descending into the pelvis.

Operation on April 12, 1887, with the assistance of Drs. R. H. Fitz, J. C. Irish, of Lowell, and G. H. Lyman, and others, under strictly Aseptic Precautions.—An incision was made through the wall of the sac at the lower angle of the cicatrix, and the whole sac subsequently laid open with the scissors in the median line nearly up to the navel. A great mass of intestines escaped at once, in spite of all my attempts to restrain them, and remained outside, covered with hot towels, through the whole operation. The neck of the sac was a longitudinal cleft in the muscular wall of the abdomen about six inches in length. The lining of the sac was a smooth membrane directly continuous with and undistinguishable from the abdominal peritoneum. The transverse colon, its mesentery, and numerous coils of the small intestines were quite firmly adherent to the lining membrane of the sac at its upper angle, requiring long and careful dissection to detach them. About ten fine silk sutures were passed by means of Peaslee's needle through the integument, three inches of fat, and finally through the middle of the rectus muscle, on each side, fully an inch back from the edge of the cleft. This was extremely difficult, owing to the tension of the muscles, the pile of intestines on the outside, and the danger of wounding the intestines inside the abdominal cavity. After the sutures were all in place, they were tied one by one, beginning at the top. The intra-abdominal tension was so great that I almost despaired of returning all the intestines into the cavity, but succeeded after numerous failures. Before closing the lower angle of the wound, I trimmed off much redundant integument and the end of the old stump, whence she had been menstruating all these years. The operation lasted over two hours.

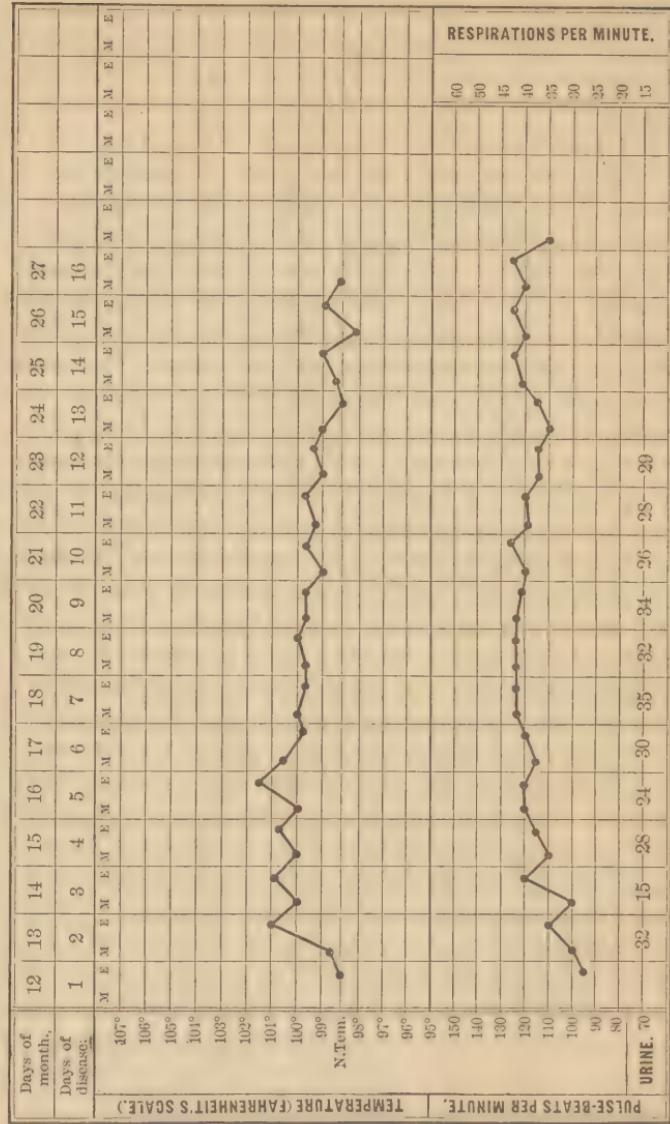
The convalescence was uneventful, as the following chart of the temperature and pulse-range will show. During the first eight days abdominal distention and constant vomiting seemed to indicate a low type of peritonitis. On the ninth day, however,

CLINICAL CHART.

Disease.

Name.

Date, April



the bowels moved, and the symptoms ceased. There was much suppuration in the cellular tissue, retarding the process of cicatrization, so that she did not leave her bed for six weeks. The

union was ultimately complete and firm, as is shown by the second photograph, taken four months after the operation.

On August 19th I failed to discover the slightest protrusion, or even weakness, in the line of the cicatrix. When the recti muscles were rendered tense the fingers could be depressed between them, but the interspace was much less than is often found after a normal labor.

CASE OF DR. MAAS.¹

CASE II.—“A large ventral hernia had occurred in a woman, thirty-six years old, six months after an otherwise successful ovariotomy, and had attained the size of a man’s head in the course of six years. On the surface of the tumor was an ulcer as large as a two-mark piece ; the abdominal walls were very thin ; the separation of the recti muscles, for a length of twelve centimetres, was such that the hand could be readily introduced into the abdominal cavity. On February 20, 1884, the operation was performed. The peritoneum was opened in the median line ; the peritoneum and the recti separately united by sutures, and the skin externally by catgut sutures, after the thin and ulcerated parts of the latter had been excised by elliptical incisions. Recovery without reaction under permanent antiseptic dressings occurred so speedily that the patient was discharged by the middle of March. The benefit was not, however, of long duration. Three months after the operation the hernia reappeared, although the patient wore an abdominal belt. The cicatrix gradually yielded, until almost the old condition recurred. A year after the operation the patient died of an intercurrent disease.”

CASES OF DR. H. MARION-SIMS.

CASE III.²—One year after ovariotomy, followed by large mural abscess, a patient discovered a small ventral hernia in the line of the incision. This attained enormous proportions in the course of a year despite the use of a pad. Dr. Sims opened the abdomen and “found a hernial ring ten inches in circumference ; within the sac was a mass of intestine that had

¹ A. Hoffa, *loc. cit.*, p. 135.

² *Am. Journ. of Obst.*, vol. xix, No. 3, p. 272, March, 1886.

been firmly matted together, so that it was necessary to tear it away. The operation lasted four hours and seventeen minutes, as many as one hundred and fifty bleeding points being tied. An elliptical piece of skin was excised and the edges of the peritoneum united by Lembert's suture; the muscles and fascia were then brought together separately with catgut and silver-wire. The patient made a perfect recovery."

CASE IV.¹—"The second case of ventral hernia upon which I operated resembled the first one very much, but was not nearly so extensive. It was done six months after the first case. The patient was one on whom I had operated for an ovarian tumor eighteen months previously. Like the first case, she was very fleshy, the adipose tissue of the abdomen being at least three inches thick. At the time of the original operation the abdominal wound was closed with a single row of sutures. The fat did not unite kindly, and consequently left an open wound which had to heal by granulation. The patient returned to me in eighteen months after the operation. I found her to be suffering from a hernia, the ring of which was about seven inches in circumference, and situated at the top of the abdominal incision, which was about an inch from the umbilicus. The operation for hernia was done much more easily than my first operation, as I did not have nearly so many difficulties in the way of adhesions to contend with. The intestines were readily freed and then dropped back into the abdominal cavity. The edges of the peritoneum, muscles, and fasciae were then trimmed off with scissors, and the whole of the loose, flabby skin which covered the hernia was cut away. The peritoneum was then separately sewed up with strong catgut sutures, the Lembert stitch being used in preference. Then the fasciae, muscles, adipose tissue, and skin were united by ligatures of Chinese twisted silk. The patient made a perfect recovery and was discharged in four weeks, the wound being entirely healed. I saw her a year afterward and she was perfectly well.

"My first case I saw again two or three weeks ago, and she continues to enjoy excellent health."

H. MARION-SIMS.

NEW YORK, September, 1887.

¹ Unpublished.

CASE OF DR. M. H. RICHARDSON, OF BOSTON.

CASE V.¹—"Jennie McPherson, aged fifty, entered the hospital August 22, 1887. She was a married woman. An abdominal tumor had been removed by Dr. John Homans four years ago. One year afterward a tumor appeared in the cicatrix, which felt like a small 'knuckle,' and increased very slowly in size. Up to the beginning of last week it had never caused any pain or discomfort. She then began to have pain and tenderness in the tumor, some vomiting, and the bowels constipated. These symptoms disappeared in the course of a few days, but she still complained of some pain. Bowels moved yesterday. The scar of the former operation in the median line was four and a half inches long. A little below the middle of it is a tumor as large as an orange, rather tense, non-fluctuating, very tender, dull on percussion, and irreducible.

"*August 24th, Operation by Dr. M. H. Richardson.*—An incision two inches long was made over the tumor a little to the left of the scar. The peritoneum was exposed. The tumor was still irreducible. Upon cutting a few fibres about the neck of the tumor it diminished in size one half. The peritoneum was then opened and a sac large enough to contain an orange disclosed, with an opening into the general peritoneal cavity one inch in diameter. The contents of the sac were entirely omental. The protruding omentum was replaced and the peritoneal sac cut off. The wound was closed by deep stitches passed through the peritoneum.

"She was perfectly comfortable after the operation, absolutely without pain or tenderness. She passed wind on the fifth day. The stitches were removed on the seventh day. The wound healed by first intention. At the end of another week she was sitting up, and on September 10th was discharged well."

HOMER GAGE,

House-Officer of the Massachusetts General Hospital.

In his "Report of One Hundred and Twenty-five Laparotomies,"² Dr. W. Gill Wylie briefly tabulates among his

¹ Unpublished.

² *Medical Record*, New York, March 19, 1887.

laparotomies (Table IV) seven cases of ventral hernia subsequent to laparotomy, which I transcribe with the omission of a few unessential data :

Seven Cases of Dr. W. Gill Wylie.

Case.	Year	Diagnosis.	Operation.	Drainage.	Results.	Remarks.
1. Hos- pital.	1885	Large ventral hernia and pelvic ab- scess.	Laparotomy, re- moving ab- scess and clos- ing hernia.	No.	Recov- ered.	Drainage-tube had been used; the center of the abscess was the pedicle; ligature of ova- riotomy two years before.
2. Pri- vate.	1885	Small hernia after lapa- rotomy.	Laparot'my and sewing up her- nia.	No.	Recov- ered.	Hernia, result of laparotomy and drainage-tube.
3. Hos- pital.	1885	Small hernia after lapa- rotomy.	Laparot'my and sewing up her- nia.	No.	Recov- ered.	Drainage-tube had been used in laparotomy one year pre- vious.
4. Pri- vate.	1885	Large hernia after lapa- rotomy.	Laparot'my and sewing up her- nia.	No.	Recov- ered.	Hernia followed laparotomy and use of drainage-tube.
5. Pri- vate.	1885	Large hernia after lapa- rotomy.	Laparot'my and sewing up her- nia.	No.	Recov- ered.	Hernia followed laparotomy two years before, and use of drainage-tube.
6. Pri- vate.	1886	Small hernia after lapa- rotomy.	Laparot'my and sewing up her- nia.	No.	Recov- ered.	Hernia followed laparotomy and use of drainage-tube six months ago.
7. Hos- pital.	1886	Very large hernia after laparotomy.	Laparot'my and sewing up her- nia.	No.	Recov- ered.	Second operation; about all the intestines and part of the stomach hang out; the ring and mass reaches half way to the knees.

These twelve cases of operation for ventral hernia after laparotomy are all that I have been able to collect by a very thorough search of medical literature with the aid of the index-catalogue of the Surgeon-General's Office, Washington, the index medicus, and other indexes. Three of these cases are now published for the first time. The cases are too few and most of them too briefly reported to warrant any deductions. I would merely call attention, as encouragement to operators, to the fact that all the patients recovered from the operation. From these reports it would be unwarrantable to deduce the percentage of success in curing the lesions.

